Table F-1. Tidal Freshwater Emergent Communities: Potential CALFED Effects and Conservation Measures

Summary Effect of Implementing CALFED Actions with Conservation Measures on Tidal Freshwater Emergent Communities: Increase in 30,000-45,000 acres of tidal freshwater emergent habitat area in the Delta Region as a result of restoration, long-term protection of existing habitat areas associated with channel islands, and enhancement of habitat resulting from control of non-native aquatic plants. Potential short-term loss of habitat area from implementation of CALFED actions and long-term increase in habitat area resulting from implementation of conservation measures to compensate for CALFED impacts.

Associated Evaluated Species: American peregrine falcon, American peregrine falcon critical habitat, Aleutian Canada goose, giant garter snake, Central Coast Steelhead Evolutionarily Significant Unit (ESU), Central Valley Steelhead ESU, delta smelt, delta smelt critical habitat, winter-run chinook salmon, winter-run chinook salmon critical habitat, tidewater goby, California black rail, white-tailed kite, Mason's lilaeopsis, Sacramento splittail, Central Valley fall-run chinook salmon, Central Valley spring-run chinook salmon, Suisun ornate shrew, Suisun song sparrow, short-eared owl, California gull, northern harrier, white-faced ibis, long-billed curlew, Sacramento perch, longfin smelt, green sturgeon, delta mudwort, delta tule pea, rose-mallow, and Suisun marsh aster.

Summary Programmatic Action Outcomes	Applicable Programmatic Actions	Potential Beneficial Effects	Potential Adverse Effects	Conservation Measures Incorporated into the Program	Overall Effect of Summary Programmatic Action Outcomes with Conservation Measures
Delta Region					
Associated Evaluated Species: American peregrine falcon, Aleutian Canada goose, giant garter snake, Central Valley Steelhead ESU, delta smelt, winter-run chinook salmon, winter-run chinook critical habitat, California black rail, white-tailed kite, Mason's lilaeopsis, Sacramento splittail, Central Valley fall-run chinook salmon, Central Valley spring-run chinook salmon, Suisun ornate shrew, Suisun song sparrow, short-eared owl, California gull, northern harrier, white-faced ibis, Sacramento perch, longfin smelt, green sturgeon, delta mudwort, delta tule pea, and Suisun Marsh aster					
Summary Programmatic Action Outcomes E11, E13a, E16a, E17, E18a, E19, E21, E22, E24, E25, Q1, Q2, Q7, W1, W2, and M1 are likely to have no discernable effect on tidal freshwater emergent wetland communities in the Delta Region.					
Ecosystem Restoration Program					
E1. Provide for more natural riverflows and Bay-Delta freshwater inflow peaks in fall, winter, and spring of all but critical years.	E010101, E010102, E010103, E010104	Potential for increase in habitat area in some locations where timing and magnitude of flows are sufficient to result in additional flooding at higher elevations than are currently reached by tidal waters (BE1).	Likely to be no discernable adverse effects on existing tidal freshwater emergent wetland habitat areas and associated evaluation species (N/E).	None.	Potential for localized improvement in hydrology for support of tidal freshwater emergent wetland vegetation.

Table F-1. Continued

Summary Programmatic Action Outcomes	Applicable Programmatic Actions	Potential Beneficial Effects	Potential Adverse Effects	Conservation Measures Incorporated into the Program	Overall Effect of Summary Programmatic Action Outcomes with Conservation Measures
E4. Provide more natural Delta hydraulic conditions (internal flow and velocity patterns) by altering channel configurations (e.g., setback levees) and physical barriers to channel flow.	E010601, E010602, E010603, E010604, E010605, E010606, E010607	Potential for increase in tidal freshwater emergent wetland habitat area if modified channels include features (e.g., benches along setback levees) that would allow for the natural reestablishment of tidal freshwater emergent vegetation (BE2).	Potential for permanent loss or degradation of existing tidal freshwater emergent wetland habitat area along channels if construction activities result in removal of tidal freshwater emergent vegetation or if the hydrology necessary to support emergent vegetation is removed (AE1).	To the extent practicable, avoid disturbance to existing tidal freshwater emergent wetland habitat areas (M1). Restore or enhance 2-5 acres of additional in-kind habitat for every acre of existing tidal freshwater emergent wetland habitat. This compensation should be implemented before actions are implemented and near affected habitat areas (M2). To the extent consistent with ERP objectives, include project design features that allow for onsite reestablishment and long-term maintenance of tidal freshwater emergent wetland vegetation following project construction (M3).	Potential for short-term loss of tidal freshwater emergent wetland habitat. Some long-term increase in habitat area as a result of implementing conservation measures. Potential for long-term increase in tidal freshwater emergent wetland habitat area as a result of implementing channel modifications.

Table F-1. Continued

Summary Programmatic Action Outcomes	Applicable Programmatic Actions	Potential Beneficial Effects	Potential Adverse Effects	Conservation Measures Incorporated into the Program	Overall Effect of Summary Programmatic Action Outcomes with Conservation Measures
			Construction-related activities associated with implementing actions could result in take of evaluated species (AE2).	To the extent practicable, avoid construction activities during the breeding period of species that could be adversely affected by the actions (M4). To the extent practicable, avoid direct disturbance to populations and individuals of evaluated plant species (M5). When feasible, establish and protect additional populations of evaluated plant species in suitable nearby habitat areas before construction activities are implemented that could affect existing populations or individuals (M6).	
			Potential for loss of evaluated plant species if tidal hydrology changes sufficiently to create conditions unsuitable for maintaining populations of evaluation plant species (AE3).	To the extent consistent with Program objectives, operate barriers in a manner that will not adversely affect the hydrology supporting populations of evaluation plant species (M7).	

Table F-1. Continued

Summary Programmatic Action Outcomes	Applicable Programmatic Actions	Potential Beneficial Effects	Potential Adverse Effects	Conservation Measures Incorporated into the Program	Overall Effect of Summary Programmatic Action Outcomes with Conservation Measures
E5a. Restoration of up to 7,500 acres of tidal shallow-water habitat.	E010401, E010402, E010403, E010404, E010405, E010406, E010407, E010901, E010902, E010903, E010904, E010905, E010906, E015201, E015202	Potential for increase in habitat area resulting from restoring shallow-water habitats along modified channels and portions of Delta islands that are restored by setting back or breaching levees (BE3).	AE1.	M1.	Potential for short-term loss of tidal freshwater emergent wetland habitat. Some long-term increase in habitat area as a result of implementing conservation measures. Potential for long-term increase in tidal freshwater emergent wetland habitat area as a result of implementing channel modifications.
		Potential for enhancement of existing tidal freshwater emergent wetland habitat values as a result of controlling invasive non-native aquatic plants (BE4).		M2.	
				M3.	
			AE2.	M4.	
				M5.	
				M6.	

Table F-1. Continued

Summary Programmatic Action Outcomes	Applicable Programmatic Actions	Potential Beneficial Effects	Potential Adverse Effects	Conservation Measures Incorporated into the Program	Overall Effect of Summary Programmatic Action Outcomes with Conservation Measures
E8. Restoration of 30,000 to 45,000 acres of tidal fresh emergent wetland.	E010401, E010402, E010404, E010405, E010407, E010606, E011101, E011102, E011201, E011202, E011401, E011402, E011403, E011404, E011405, E015202	Substantial increase in tidal freshwater emergent wetland habitat area and suitable habitat for associated species (BE5).	Potential for short-term loss or degradation of existing tidal freshwater emergent wetland habitat area along channels if restoration activities result in removal of tidal freshwater emergent vegetation (AE4). AE2.	To the extent consistent with ERP objectives, initially restore habitat areas in locations that do not support tidal emergent vegetation before restoring habitat in areas that support emergent vegetation to ensure that there is no net loss of habitat area over the period during which restoration is implemented (M8). M4. M5. M6.	Long-term substantial increases in tidal freshwater emergent wetland habitat.
E9. Maintenance of existing and restoration of 200-800 acres of channel islands and associated habitats.	E011201, E011202, E015002, E016001, E016002	Potential for restoration of some tidal freshwater emergent wetland habitat area in association with restoration of channel islands (BE6). BE4.	Potential for short-term or permanent loss or degradation of existing tidal freshwater emergent wetland habitat area along island shorelines if shorelines are hardened to reduce or eliminate erosion of channel islands (AE5).	M1. M2. M3.	Potential for short-term loss of tidal freshwater emergent wetland habitat. Some long-term increase in habitat area as a result of implementing conservation measures. Potential for long-term protection of existing habitat areas associated with channel islands from loss to erosion.

Table F-1. Continued

Summary Programmatic Action Outcomes	Applicable Programmatic Actions	Potential Beneficial Effects	Potential Adverse Effects	Conservation Measures Incorporated into the Program	Overall Effect of Summary Programmatic Action Outcomes with Conservation Measures
		Long-term protection of existing habitat areas associated with channel islands from potential future loss from erosion (BE7).	AE2.	M4. M5. M6.	
E10a. Restoration of 85-190 miles of tidal sloughs.	E015201, E015202, E011101, E011102	Potential for increase in tidal freshwater emergent wetland habitat area along tidal sloughs where freshwater emergent wetland vegetation could naturally reestablish (BE8).	AE4. AE2.	M8. M3. M4. M5. M6.	Potential for short-term loss of tidal freshwater emergent wetland habitat. Some long-term increase in habitat area as a result of implementing conservation measures. Potential for long-term increase in tidal freshwater emergent wetland habitat area.

Table F-1. Continued

Summary Programmatic Action Outcomes	Applicable Programmatic Actions	Potential Beneficial Effects	Potential Adverse Effects	Conservation Measures Incorporated into the Program	Overall Effect of Summary Programmatic Action Outcomes with Conservation Measures
E15a. Restoration of 48–85 miles of riparian habitat along channels, restoration of riparian habitat in association with setback levees, protection of 500 acres of existing riparian forest, and reduction of current invasive riparian plants by 50%.	E010501, E010502, E010606, E011101, E011102, E011201, E011202, E011601, E011602, E011603, E011604, E011605, E011606, E011607, E011608, E011609, E014901, E015301, E015302, E015303	Potential for increase in habitat area along lower elevations, within tidal influence, of restored habitats (BE9).	AE1. AE2.	M1. M2. M3. M4. M5. M6.	Potential for long-term increases in tidal freshwater emergent wetland habitat. Potential for short-term loss of tidal freshwater emergent wetland habitat resulting from construction and small long-term increase in habitat quality.
E20. Reduction in the adverse effects of dredging on estuarine aquatic habitats.	E015001, E015002, E015003, E015004	Potential for long-term protection of existing tidal freshwater emergent wetland habitat from the direct adverse effects of dredging (BE10). Potential for increases in suitable substrates necessary for the natural reestablishment of emergent vegetation as a result of increased sediment deposition in channels (BE11).	N/E	None.	Potential for localized increases in tidal freshwater emergent wetland vegetation.

Table F-1. Continued

Summary Programmatic Action Outcomes	Applicable Programmatic Actions	Potential Beneficial Effects	Potential Adverse Effects	Conservation Measures Incorporated into the Program	Overall Effect of Summary Programmatic Action Outcomes with Conservation Measures
E27a. Reduction in the concentrations and loadings of contaminants in the aquatic environment by 25%–50%.	E015701, E015702	Reduction in contaminant loadings in tidal freshwater emergent habitats could improve the survivability of some species and increase aquatic invertebrate populations that are adversely effected by toxic agents (BE12).	N/E	None.	Implementation of the proposed actions would most likely have no discernable effect on evaluated species' numbers or distribution.
E28. Reduction in the adverse effects of boat wakes on shoreline habitats and wildlife in sensitive habitat areas.	E016001, E016002, E016003, E016004, E016005, E016006	Long-term protection of existing habitat areas from boat-wake-induced erosion of shoreline and channel island habitat areas (BE13). Potential for increased nesting success of species that nest in tidal emergent vegetation as a result of reducing the potential for boat wakes to swamp nests (BE14).	N/E	None.	Potential for long-term protection of habitat areas from loss associated with boat-wake-induced erosion and potential for increase in nesting success of species that nest in tidal emergent vegetation.
Levee System Integrity					
L1. Improvement and maintenance of Delta levees.	L010101, L010102, L010201, L010202, L010301	Likely to be no discernable beneficial effects on existing habitat areas and associated evaluation species (N/E).	AE1.	M1. M2.	Potential for short-term loss of tidal freshwater emergent wetland habitat. Some long-term increase in habitat area as a result of implementing conservation measures.

Table F-1. Continued

Summary Programmatic Action Outcomes	Applicable Programmatic Actions	Potential Beneficial Effects	Potential Adverse Effects	Conservation Measures Incorporated into the Program	Overall Effect of Summary Programmatic Action Outcomes with Conservation Measures
			AE2.	M3. M4. M5. M6.	
L2. Reduction in the risk to levee stability from subsidence.	L010401, L010402	Potential beneficial effects of the program are not analyzed. The type and magnitude of potential beneficial effects would depend on the type of specific program actions that are implemented (N/A).	Potential adverse effects of the program are not analyzed. The type and magnitude of potential adverse effects would depend on the type of specific program actions that are implemented (N/A).	None.	Potential program effects cannot be evaluated.
Water Quality Program					
Q4. Reduction of pesticide loadings in the aquatic environment.	Q010501	BE12.	N/E	None.	Implementation of the proposed actions would most likely have no discernable effect on evaluated species numbers or distribution.

Table F-1. Continued

Summary Programmatic Action Outcomes	Applicable Programmatic Actions	Potential Beneficial Effects	Potential Adverse Effects	Conservation Measures Incorporated into the Program	Overall Effect of Summary Programmatic Action Outcomes with Conservation Measures
Water Use Efficiency Program					
W3. Provide planning and technical assistance, financing assistance, and assurances for development and implementation of water management plans and best management practices to urban water agencies.	None.	N/A	N/A	None.	Potential program effects cannot be evaluated.
W4. Support development and implementation of water-recycling projects.	None.	N/A	N/A	None.	Potential program effects cannot be evaluated.
Water Transfer Program					
T1. Implement a framework of actions, policies, and processes that will facilitate transfers and the further development of a statewide water transfer market.	None.	Potential for increase in tidal freshwater emergent wetland habitat area if water transfers result in sufficiently augmenting tidal streamflows to allow the natural establishment of tidal freshwater emergent wetland vegetation (BE15).	Potential for loss or degradation of existing tidal freshwater emergent wetland habitat areas if water is transferred from uses that currently support tidal freshwater emergent wetland vegetation (AE6).	M1. M2.	Potential for short-term loss or degradation of existing tidal freshwater emergent wetland habitat. Some long-term increase in habitat area as a result of implementing conservation measures. Potential for long-term increases in habitat area if water is transferred to uses that would support tidal freshwater emergent wetland habitat.

Table F-1. Continued

Summary Programmatic Action Outcomes	Applicable Programmatic Actions	Potential Beneficial Effects	Potential Adverse Effects	Conservation Measures Incorporated into the Program	Overall Effect of Summary Programmatic Action Outcomes with Conservation Measures
Conveyance Facilities					
C1. Construct and operate modifications to existing south-Delta conveyance features.	C010101, C010102, C010103, C010104, C010105, C010106, C010107, C010108	N/E	Potential for permanent loss or degradation of tidal freshwater emergent wetland habitat along channels upstream of new screened intake at Clifton Court Forebay and operable barriers if operation of new structures adversely affects the hydrology supporting existing tidal freshwater emergent wetland habitat (AE7). Construction of interties, supporting infrastructure, and operable barriers could result in the permanent loss of tidal freshwater emergent wetland habitat (AE8). AE2.	To the extent consistent with program objectives, operate new structures in a manner that will not adversely affect the hydrology supporting tidal freshwater emergent wetland vegetation upstream of the structures (M9). M1. M2. M3. M4. M5. M6.	Potential for short-term loss of tidal freshwater emergent wetland habitat.

Table F-1. Continued

Summary Programmatic Action Outcomes	Applicable Programmatic Actions	Potential Beneficial Effects	Potential Adverse Effects	Conservation Measures Incorporated into the Program	Overall Effect of Summary Programmatic Action Outcomes with Conservation Measures
C2. Construct and operate modifications to existing north-Delta conveyance features.	C020101, C020102, C020103	BE2.	Construction of conveyance facilities and associated infrastructure could result in short-term or permanent loss or degradation of tidal freshwater emergent wetland habitat (AE9). AE2. AE3.	M1. M2. M3. M4. M5. M6. M7.	Potential for short-term loss of emergent vegetation and, depending on design of conveyance features, potential for long-term increase in habitat area. Some long-term increase in habitat area as a result of implementing conservation measures.
C3. Construct and operate an isolated conveyance facility from the Sacramento River along the east side of the Delta to Clifton Court Forebay.	C030101	N/E	AE9.	M1. M2.	Potential for short-term loss of tidal freshwater emergent wetland habitat. Some long-term increase in habitat area as a result of implementing conservation measures.

Table F-1. Continued

Summary Programmatic Action Outcomes	Applicable Programmatic Actions	Potential Beneficial Effects	Potential Adverse Effects	Conservation Measures Incorporated into the Program	Overall Effect of Summary Programmatic Action Outcomes with Conservation Measures
			AE2.	M3. M4. M5. M6.	
Storage Facilities					
S1. Construct and operate enlarged or new surface storage facilities.	None.	N/E	Potential for permanent loss or degradation of tidal wetlands associated with channels adjacent to storage islands as a result of implementing actions necessary to reinforce storage island levees (AE10). AE2.	To the extent consistent with program objectives, select Delta islands that support little or no emergent vegetation along adjacent channels for use as storage facilities (M10). M2. M3. M4. M5. M6.	Potential for short-term loss of tidal wetlands; some long-term increase in habitat area as a result of implementing conservation measures.

Table F-1. Continued

Summary Programmatic Action Outcomes	Applicable Programmatic Actions	Potential Beneficial Effects	Potential Adverse Effects	Conservation Measures Incorporated into the Program	Overall Effect of Summary Programmatic Action Outcomes with Conservation Measures
Water Operations					
01. Implement operating criteria needed to improve water management for beneficial uses.	None.	N/A	N/A	None.	Potential program effects cannot be evaluated.
02. Implement an Environmental Water Account to provide operational flexibility to achieve environmental benefits.	None.	N/A	N/A	None.	Potential program effects cannot be evaluated.
Bay Region					
CALFED actions proposed for the Bay Region would not affect tidal freshwater emergent communities.					
Sacramento River Region					
CALFED actions proposed for the Sacramento River Region would not affect tidal freshwater emergent communities.					
San Joaquin River Region					
CALFED actions proposed for the San Joaquin River Region would not affect tidal freshwater emergent communities.					

Contributors to the development of this table: Lisa Webber, Pete Rawlings, and Gerrit Platenkamp of Jones & Stokes Associates.

Table F-2. Key to Table F-1 Potential Beneficial Effects, Potential Adverse Effects, and Conservation Measures Codes

Potential Beneficial Effects	Potential Adverse Effects	Conservation Measures Incorporated into the Program
Potential for increase in habitat area in some locations where timing and magnitude of flows are sufficient to result in additional flooding at higher elevations than are currently reached by tidal waters (BE1).	Potential for permanent loss or degradation of existing tidal freshwater emergent wetland habitat area along channels if construction activities result in removal of tidal freshwater emergent vegetation or if the hydrology necessary to support emergent vegetation is removed (AE1).	To the extent practicable, avoid disturbance to existing tidal freshwater emergent wetland habitat areas (M1).
Potential for increase in tidal freshwater emergent wetland habitat area if modified channels include features (e.g., benches along setback levees) that would allow for the natural reestablishment of tidal freshwater emergent vegetation (BE2).	Construction-related activities associated with implementing actions could result in take of evaluated species (AE2).	Restore or enhance 2-5 acres of additional in-kind habitat for every acre of existing tidal freshwater emergent wetland habitat. This compensation should be implemented before actions are implemented and near affected habitat areas (M2).
Potential for increase in habitat area resulting from restoring shallow-water habitats along modified channels and portions of Delta islands that are restored by setting back or breaching levees (BE3).	Potential for loss of evaluated plant species if tidal hydrology changes sufficiently to create conditions unsuitable for maintaining populations of evaluation plant species (AE3).	To the extent consistent with ERP objectives, include project design features that allow for onsite reestablishment and long-term maintenance of tidal freshwater emergent wetland vegetation following project construction (M3).
Potential for enhancement of existing tidal freshwater emergent wetland habitat values as a result of controlling invasive non-native aquatic plants (BE4).	Potential for short-term loss or degradation of existing tidal freshwater emergent wetland habitat area along channels if restoration activities result in removal of tidal freshwater emergent vegetation (AE4).	To the extent practicable, avoid construction activities during the breeding period of species that could be adversely affected by the actions (M4).
Substantial increase in tidal freshwater emergent wetland habitat area and suitable habitat for associated species (BE5).	Potential for short-term or permanent loss or degradation of existing tidal freshwater emergent wetland habitat area along island shorelines if shorelines are hardened to reduce or eliminate erosion of channel islands (AE5).	To the extent practicable, avoid direct disturbance to populations and individuals of evaluated plant species (M5).

Table F-2. Continued

Potential Beneficial Effects	Potential Adverse Effects	Conservation Measures Incorporated into the Program
Potential for restoration of some tidal freshwater emergent wetland habitat area in association with restoration of channel islands (BE6).	Potential for loss or degradation of existing tidal freshwater emergent wetland habitat areas if water is transferred from uses that currently support tidal freshwater emergent wetland vegetation (AE6).	When feasible, establish and protect additional populations of evaluated plant species in suitable nearby habitat areas before construction activities are implemented that could affect existing populations or individuals (M6).
Long-term protection of existing habitat areas associated with channel islands from potential future loss from erosion (BE7).	Potential for permanent loss or degradation of tidal freshwater emergent wetland habitat along channels upstream of new screened intake at Clifton Court Forebay and operable barriers if operation of new structures adversely affects the hydrology supporting existing tidal freshwater emergent wetland habitat (AE7).	To the extent consistent with Program objectives, operate barriers in a manner that will not adversely affect the hydrology supporting populations of evaluation plant species (M7).
Potential for increase in tidal freshwater emergent wetland habitat area along tidal sloughs where freshwater emergent wetland vegetation could naturally reestablish (BE8).	Construction of interties, supporting infrastructure, and operable barriers could result in the permanent loss of tidal freshwater emergent wetland habitat (AE8).	To the extent consistent with ERP objectives, initially restore habitat areas in locations that do not support tidal emergent vegetation before restoring habitat in areas that support emergent vegetation to ensure that there is no net loss of habitat area over the period during which restoration is implemented (M8).
Potential for increase in habitat area along lower elevations, within tidal influence, of restored habitats (BE9).	Construction of conveyance facilities and associated infrastructure could result in short-term or permanent loss or degradation of tidal freshwater emergent wetland habitat (AE9).	To the extent consistent with program objectives, operate new structures in a manner that will not adversely affect the hydrology supporting tidal freshwater emergent wetland vegetation upstream of the structures (M9).
Potential for long-term protection of existing tidal freshwater emergent wetland habitat from the direct adverse effects of dredging (BE10).	Potential for permanent loss or degradation of tidal wetlands associated with channels adjacent to storage islands as a result of implementing actions necessary to reinforce storage island levees (AE10).	To the extent consistent with program objectives, select Delta islands that support little or no emergent vegetation along adjacent channels for use as storage facilities (M10).

Table F-2. Continued

Potential Beneficial Effects	Potential Adverse Effects	Conservation Measures Incorporated into the Program
Potential for increases in suitable substrates necessary for the natural reestablishment of emergent vegetation as a result of increased sediment deposition in channels (BE11).	Potential adverse effects of the program are not analyzed. The type and magnitude of potential adverse effects would depend on the type of specific program actions that are implemented (N/A).	
Reduction in contaminant loadings in tidal freshwater emergent habitats could improve the survivability of some species and increase aquatic invertebrate populations that are adversely effected by toxic agents (BE12).	Likely to be no discernable adverse effects on existing tidal freshwater emergent wetland habitat areas and associated evaluation species (N/E).	
Long-term protection of existing habitat areas from boat-wake-induced erosion of shoreline and channel island habitat areas (BE13).		
Potential for increased nesting success of species that nest in tidal emergent vegetation as a result of reducing the potential for boat wakes to swamp nests (BE14).		
Potential for increase in tidal freshwater emergent wetland habitat area if water transfers result in sufficiently augmenting tidal streamflows to allow the natural establishment of tidal freshwater emergent wetland vegetation (BE15).		
Potential beneficial effects of the program are not analyzed. The type and magnitude of potential beneficial effects would depend on the type of specific program actions that are implemented (N/A).		
Likely to be no discernable beneficial effects on existing habitat areas and associated evaluation species (N/E).		